

REMARKS

Claims 1-4, 6, 8-13, 15-17 and 20 are pending after entry of this amendment. Claims 5, 7, 14, 18 and 19 have been canceled. Claim 1 has been amended to correct a typographical error and to incorporate the features of original claims 5 and 7. Claim 17 has been made dependent on claim 1. Support for the amendments can be found in the specification and claims of the original application.

I. CLAIM REJECTIONS UNDER 35 U.S.C. § 112

The Office Action has rejected claims 1-20 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Office Action states that the units of kg/m^3 are not recognized units of melt flow rate. Applicants respectfully disagree with this rejection for the following reason.

Claim 1 has been amended to correct a typographical error with respect to the units of melt flow rate, specifically to recite units of g/10 min. Support for this amendment can be found in the specification as originally filed. As amended, claim 1 recites the recognized units for melt flow rate of g/10 min, this rejection should be withdrawn.

II. CLAIM REJECTIONS UNDER 35 U.S.C. § 102(b)

The Office Action has rejected claims 1-9, 11-12, and 14-20 under 35 U.S.C. § 102(b), as allegedly being anticipated by U.S. Patent No. 6,605,675 to Mawson *et al.* (hereinafter “Mawson”). Applicants respectfully disagree with this rejection for the following reasons.

Mawson does not anticipate the claims of the present application. As amended, claim 1 recites a copolymer mixture that is bimodal, comprising a lower molecular weight component and a higher molecular weight component; wherein the lower molecular weight component has

an MFR₂ of at least 100 g/10 min and a density of from 945 kg/m³ to 960 kg/m³. Mawson fails to disclose a copolymer mixture in which the lower molecular weight component thereof has an MFR₂ of at least 100 g/10 min and a density of from 945 to 960 kg/m³. Thus, claim 1 and the claims dependent therefrom are not anticipated by Mawson and this rejection should be withdrawn.

The disclosure by Mawson of a bimodal copolymer (col. 44) is noted, but the MFR₂ of the lower molecular component is not quoted by Mawson. Moreover, there is no disclosure in column 44 that the polymer described is a mixture of copolymers, as is recited in claim 1 of the present application. In particular, Mawson, in column 44, does not disclose that the polymer is an ethylene polymer. In contrast, the claims of the present application recite a mixture of ethylene copolymers.

Similarly, the disclosure of a bimodal material in column 45 has the same shortcomings as that of column 44, as there is no disclosure of a mixture of ethylene copolymers and no disclosure of an appropriate MFR₂ of the LMW component.

The Office Action has argued that the process features of the claims carry little patentable weight. It is the position of the applicant that one of skill in the art is aware of differences between Ziegler-Natta catalyst produced polymers and those of catalysts such as metallocenes. The use of a Ziegler-Natta does impart characteristics to the polymer achievable only with Ziegler-Natta catalysts. Thus, the claims of the present application are not anticipated by Mawson, irrespective of the weight given to the process features of the claims.

III. CLAIM REJECTIONS UNDER 35 U.S.C. § 103(a)

The Office Action has rejected claims 10 and 13 under 35 U.S.C. § 103(a), as allegedly being obvious over Mawson. Applicants respectfully disagree with this rejection for the following reasons.

As an initial matter, Mawson is directed more to a catalyst formation process rather than any particular product. Mawson lists as end uses for a formed polymer, essentially all possible applications for a polymer material. Both the nature of any polymer formed according to Mawson, along with the end use thereof, are thus essentially irrelevant to Mawson's disclosure.

In contrast, the amended claims of the present application recite a shrink film manufactured using a particular bimodal polymer, and in various dependent claims, of a certain thickness. Insofar, however, as a bimodal polymer is disclosed by Mawson, there is no teaching or disclosure, for example, in columns 44 and 45, that a bimodal polymer should be an ethylene copolymer mixture. Further, there is no disclosure in Mawson that a polymer should be polyethylene, nor of the high MFR₂ range of the low molecular weight component recited in the amended claims of the present application. It should also be noted that, in column 45, the formed polymer is suggested for blow moulding applications and not shrink film formation.

The polymer of in column 44 of Mawson is not specifically disclosed in connection with shrink films either. In fact, the suggested application is grocery sacks (see column 45, line 19). Furthermore, the polymer in column 44 is disclosed in the context of polymers produced using dual site catalysts. With a dual site material, it should be noted that the formation of a bimodal polymer occurs in a one stage process, such that the conditions utilized to form each component should be the same. For clarification, one component of such a catalyst produces one polymer component and the other polymer is formed from the second component of the catalyst.

However, in such a process, both components should be formed under identical conditions of temperature, pressure, comonomer content, etc., since the process is only run once. Thus, properties such as melt flow rate or properties of one component relative to another cannot be manipulated in such a process.

To obtain a high MFR (*i.e.* melt index) and high density in the lower molecular weight component as recited in amended claim 1, a low level of comonomer will typically be required. To achieve an overall density of 915 to 940 kg/m³ one must simultaneously produce a higher molecular weight component which has a lower density to compensate for the higher density of the low molecular weight component. Thus, a higher molecular weight component with a greater comonomer content can be beneficial; however, if the comonomer content is increased to get more comonomer in the higher molecular weight component, one can automatically end up putting more comonomer in the lower molecular weight component and its MFR tumbles. It is believed therefore that the manufacture of the polymers used in the shrink films of the present application are therefore not achievable in a dual site system. For this reason, amended claim 1 recites the use of a multistage process to form the polymers.

The high MFR of the lower molecular weight component means that the MFR of a high molecular weight component can be decreased giving better mechanical properties. As described on page 4, line 8 of the as-filed application, the mechanical properties of the claimed films are highly advantageous. Thus, the shrink films claimed have

“a particularly beneficial combination of very low hot shrink force and very high cold shrink force. The low hot shrink force serves to reduce hole formation during the shrinking operation (a major problem with conventional shrink films) while the high cold shrink forces provide excellent holding properties, i.e. they serve to stabilize the shrink-wrapped product” (page 4) (emphasis added)

Moreover, even after shrinking the films of the invention have good properties. The shrunk film

“has mechanical properties (e.g. dart drop, and tensile strength) which are improved relative to conventional shrink films, especially at very low temperatures. As a result the shrink films of the invention are especially suited for use in packaging products which will be exposed to low temperatures during transportation or storage.” (page 4) (emphasis added)

This combination of properties relevant to shrink wrapping is both unexpected and highly advantageous.

The higher MFR of the lower molecular weight component also provides more rapid crystallization during the shrinking process, giving improved mechanical properties. On page 8 of the as-filed application, it is noted that:

The high density low molecular weight copolymer will have a higher crystallization temperature and, during the shrinking process, will crystallize more rapidly than the lower density higher molecular weight copolymer. Thus during the film forming process a high degree of polymer chain entanglement will occur leading to increased toughness in the shrink film and to a highly oriented structure which provides improved shrinkage properties. (emphasis added)

Considering in detail the rejected claims, Mawson is primarily directed to new catalysts and their use in generic polymerization processes and fails to teach or suggest the shrink films of the present application. Specifically, Mawson, when considered as a whole, fails to teach or suggest each of the recited features of the rejected claims, including a film having a thickness of 20 μm to 120 μm or 100 μm to 200 μm . As noted above, Mawson fails to teach or suggest the features of amended claim 1, which features are also included in dependent claims 10 and 13.

The Office Action alleges that claims 10 and 13 would have been obvious over Mawson and that one of skill in the art could determine, through routine optimization, a number of layers

necessary to achieve a given thickness. As an initial matter, the Office Action incorrectly states that Mawson discloses a multilayer film. In contrast, Mawson discloses that “[m]olded articles include single and multi-layered construction in the form of bottles, tanks, large hollow articles, rigid food containers and toys, etc.” The multilayered film of the present application is distinguishable from and non-obvious over the multi-layered molded construction of Mawson. Moreover, even if the multi-layered construction of Mawson were construed to be a multilayered film, Mawson fails to provide sufficient detail regarding such multi-layered construction, such as the thickness of each layer, to enable one of skill in the art to obtain the films of claims 10 and 13.

It should be noted that the claimed features of the present application, namely the high melt flow rate of the lower molecular weight component, can advantageously provide enhanced mechanical properties of a shrink film by facilitating the use of a high molecular weight component having a reduced melt flow rate. After shrinking, the films of the present application can exhibit an unexpected and advantageous combination of properties, such as, for example, dart drop and tensile strength, relative to conventional shrink films. These features and combinations thereof are neither taught nor suggested by Mawson.

The Office Action has failed to identify a motivation or suggestion for modifying Mawson with the specific claimed features of the present application. In addition, Mawson also fails to teach or suggest how to select one of the over 200 disclosed catalysts to make a shrink film (one of numerous possible end applications) comprising all of the features of claims 1, 10 and 13.

Thus, nothing in Mawson would have rendered the claims obvious. This rejection should therefore be withdrawn.

CONCLUSION

In view of the amendments and remarks herein, Applicants request that the rejections be withdrawn and that a Notice of Allowance be issued. The Examiner is invited and encouraged to directly contact the undersigned if such contact may facilitate prosecution of the application to issuance.

A credit card payment submitted via EFS Web in the amount of \$460.00, representing the fee for a large entity under 37 C.F.R. § 1.17(a)(2) for a Two-Month Extension of Time is enclosed. This amount is believed to be correct; however, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-0629.

Respectfully submitted,

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